U.S. FOREST SERVICE.

TREE DISTRIBUTION UNDER THE KINKAID ACT, 1911. 1918.

Issued December 18, 1911.

United States Department of Agriculture,

FOREST SERVICE.

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TREE DISTRIBUTION UNDER THE KINKAID ACT, 1911.

Under the agricultural appropriation act for 1912, there is a provision for the free distribution of young trees from the Halsey Nursery, Nebraska National Forest, Halsey, Nebr., as follows:

That from the nurseries on said forest the Secretary of Agriculture, under such rules and regulations as he may prescribe, may furnish young trees free, so far as they may be spared, to residents of the territory covered by "An act increasing the area of homesteads in a portion of Nebraska," approved April 28, 1904.

The act referred to is familiarly known as the Kinkaid Act, and the area included is described as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the approval of this act entries made under the homestead laws in the State of Nebraska west and north of the following line, to wit: Beginning at a point on the boundary line between the States of South Dakota and Nebraska where the first guide meridian west of the sixth principal meridian strikes said boundary; thence running south along said guide meridian to its intersection with the fourth standard parallel north of the base line between the States of Nebraska and Kansas; thence west along said fourth standard parallel to its intersection with the second guide meridian west of the sixth principal meridian; thence south along said second guide meridian to its intersection with the third standard parallel north of the said base line; thence west along said third standard parallel to its intersection with the range line between ranges 25 and 26 west of the sixth principal meridian; thence south along said line to its intersection with the second standard parallel north of the said base line; thence west on said standard parallel to its intersection with the range line between ranges 30 and 31 west; thence south along said line to its intersection with the boundary line between the States of Nebraska and Kansas, shall not exceed in area 640 acres, and shall be as nearly compact in form as possible, and in no event over 2 miles in extreme length: *Provided,* That there shall be excluded from the provisions of this act such lands within the territory herein described as in the opinion of the Secretary of the Interior it may be reasonably practicable to irrigate under the national irrigation law or by private enterprise, and that said Secretary shall, prior to the date above mentioned, designate and exclude from entry under this act the lands, particularly along the North Platte River, which in his opinion it may be possible to irrigate as aforesaid; and shall thereafter, from time to time, open to entry under this act any of the lands so excluded, which, upon further investigation, he may conclude can not be practically irrigated in the manner aforesaid.

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Up to the present time it has been impossible to meet the demand for trees to be distributed under this law for the reason that the Government nursery maintained and operated at Halsey, Nebr., has never had a sufficient output for the work of afforesting the sand hills on the National Forest, much less to distribute trees free of charge to a large number of applicants. However, with a more thorough knowledge of tree growing under the difficult conditions that exist at Halsey, and with a wider experience in transplanting and caring for the trees, it will be possible to increase the capacity of the nursery and to provide trees for those who wish to take advantage of this opportunity. The capacity will be augmented until, in 1914, 2,000,000 trees will be ready for planting annually; about 400,000 will be available for distribution in the Kinkaid district. In 1912, only a small number—probably not more than 50,000—will be ready, and in the following year, perhaps 100,000; not until 1914 can the distribution be made on a large scale.

Few trees have ever grown naturally in the territory covered by this act. It is a region of moderate rainfall (records show a precipitation of about 22½ inches per annum at Halsey, decreasing to about 15 inches in the northwest corner of Nebraska), but the soil is not fertile, and there are practically no facilities for getting water on the land by irrigation. Many of the attempts at agriculture have failed. It seems fair to suppose, however, that trees will grow if they can get a start and be protected from stock and from fire. The need for a local timber supply is keenly felt, and any tree which will produce posts or fuel within a reasonable period is worth raising, especially on such lands as will not support a good agricultural crop. In this way land which is now unproductive will give some returns if trees are planted and cared for properly.

OBJECTS OF THE TREE PLANTING.

With conditions of soil and climate so unfavorable to tree growth, it is not to be expected that planting ever will result in the production of high-grade timber. The trees which are planted in this part of Nebraska will never grow to great height nor will their trunks be straight and clear of branches; but it is possible that the settler of to-day will be getting fence posts and small dimension farm timbers from his own woodlot in 1930, and by 1920 he should be able to secure a large amount of firewood. Besides the actual material there is the added benefit of protection against wind afforded by the growing trees.

The trees which are likely to give the best satisfaction are the coniferous, or so-called "evergreen," trees. Western yellow pine, Norway pine, Scotch pine, and jack pine will grow in this region. Some of the hardwoods (deciduous or broadleaf trees) which may give

satisfaction are cottonwood, American elm, honey locust, hackberry, and green ash, though these species should preferably be planted in the bottoms. The degree of success which will follow their planting will depend largely on the care which is exercised in selecting the site on which the trees will be planted and the amount of cultivation which can subsequently be bestowed upon them; some trees will do better on a north slope; others do better on a ridge; most of the hardwood species will succeed best in the bottoms. The man who expects to get results must plant with due reference to the needs of the different species he is employing. The following suggestions should be of assistance:

THE SELECTION OF SITES FOR PLANTING.

The influence of the site, such as north slope, south slope, ridge top, and bottom, strongly affects the growth of various tree species; it is probable that the greatest success will come from planting on the north slopes. In these situations the soil is generally more moist and it is protected to some extent from the drying heat of the sun. Frost leaves the ground on the north slopes a little later in the spring, but by the time the season is far enough advanced for planting (generally March 15 to 30) the soil in the north slopes will be in excellent condition for planting. Where the ground is level, or nearly so, the choice of site is, of course, not governed by topographical conditions; one place is as good as another.

The period from April 1 to June 30 is marked by more than the average rainfall. Records show that 47 per cent of the total rainfall for the whole year comes in the three months—April, May, and June. It is very important, therefore, to begin planting immediately after the frost leaves the ground, so that the trees can get the full benefit of the spring rains.

There are several coniferous trees suitable for planting in this district, and a brief discussion of the characteristics of each is given to assist the planter in selecting those which will best suit his particular needs.

JACK PINE.

Jack pine (*Pinus divaricata*) is hardy and rapid growing. It will grow on sterile soil, but requires plenty of light. The wood is light, moderately strong, coarse-grained, and suitable for rough construction and for posts when treated with a preservative material.

The jack pine will grow even on south slopes where there is little moisture and where many other trees have failed. While it is not the most desirable tree from the standpoint of utility, its ability to withstand dry climate and poor soil makes it valuable.

NORWAY PINE.

Norway pine (*Pinus resinosa*) is adapted to a sandy loam soil, but will accommodate itself to poorer conditions. It requires plenty of light, is not subject to disease, and is a fairly rapid grower. The wood resembles that of the eastern white pine, but is a little heavier, stronger, and harder. It makes good lumber, posts, and ties.

In the sand-hill region it will do best on north slopes or where the soil is not dried out too quickly.

WESTERN YELLOW PINE.

Western yellow pine (*Pinus ponderosa*) is one of the hardiest of the trees that can be grown in this region and the quality of the wood, together with its freedom from disease, makes it very satisfactory. It will do well on ridges and north slopes or in the pockets, and responds to cultivation with increased growth. It thrives best in pure stands (that is, unmixed with other species) and grows rapidly enough to establish itself within a few years. It is probably the most valuable tree that can be grown in this part of the country and should give more uniform success than any other species.

SCOTCH PINE.

Scotch pine (*Pinus sylvestris*) is a widely distributed tree, native to Europe and Asia. It can thrive where the atmosphere is very dry, and while it can not endure great extremes of cold it is adapted to the conditions in the sand hills, though it will usually be well to plant Scotch pine in the most sheltered or protected parts of the plantation. It is extremely intolerant of shade, and therefore must be permitted to have plenty of light. Its rate of growth compares favorably with the other species adapted to this region, and its wood can be used for ordinary farm purposes.

HARDWOODS.

Of the hardwoods, the cottonwood is perhaps the best adapted to the unfavorable conditions exhibited in this district. It can not be expected that hardwoods will grow unless they are planted in the more moist situations, and where they can receive the benefit of cultivation for at least three or four years. American elm, boxelder, and silver maple are species which will probably succeed if they are planted where they can get some water; and cultivation is quite necessary until the trees are well established. Silver maple will perhaps give fair success on the dry soils of this district. Boxelder has a very wide range and is hardy, but its form is not especially good and it is of little economic value, since the wood is soft and light. It is valuable chiefly as a windbreak. Green ash is a tree which grows best on

moist soils, and while it sometimes lives on upland soils, its growth there is very slow. It is also subject to the attacks of insects.

The hardwoods all require as much moisture as they can possibly get, and for that reason they should always be planted on north slopes or moist bottoms. Since most of the land in the Kinkaid district is characterized by a sandy soil, it is obvious that the pines are the trees to plant, and that hardwoods should be employed only where the better grades of soil are found or where some local conditions favor their growth. Honey locust and hackberry are well fitted for planting in this region by their ability to grow on dry soils and to resist severe frosts without injury.

CULTIVATION OF THE SOIL BEFORE PLANTING.

The importance of preparing the soil for the tree planting can hardly be overestimated. Except in very large operations, it will probably be possible to devote some time to the preparation and cultivation of the ground on which the planting is to be done, and the reward for preliminary cultivation, which will be shown in the better growth and vigor of the tree, is worth the extra effort.

Since it will be two or three years before trees can be distributed in quantity, there will be ample time for the selection and preparation of the ground which is to be used for tree planting. Trees will generally do better on a more or less porous soil, and hence any form of cultivation which tends to bring this condition about will be helpful in promoting the chances for success. In many instances the planting in this district will be done on new ground, and where such is the case it will be better to do no plowing at all except in protected situations, such as bottom lands, and pockets, where there is some protection against the strong winds. Elsewhere the trees may be set individually in holes, with the sod broken on an 18-inch space immediately around the tree. The remaining cover of sod and grass will serve as a protection against wind and drifting sand. If a supply of stable manure is available it will be a great aid to the trees to have some well-rotted manure put in the holes in which the trees are placed at the time planting is done. The manure should be thoroughly worked into the soil but not allowed to come in direct contact with the roots of the tree. Cultivation for a period of two or three years after planting will insure a good start, and the more cultivation that can be given, the better will be the results.

CARE OF TREES WHEN RECEIVED FROM NURSERY.

Young trees are very tender and susceptible to injury, and if the roots are exposed to the air, even for a short time, they are likely to be injured, if not killed outright. Extreme care with the stock will result in a proportionate success. The trees will be shipped in

bundles that will allow a free circulation of air for the tops. But the roots will be packed in damp moss to prevent drying out, and great care must be used to see that this damp moss is kept in contact with the tree roots until the trees can be "heeled in," awaiting final planting. Save this moss for use in final planting. To "heel in," dig a trench about 8 inches deep and about 15 inches wide, with a slanting surface, as shown in figure 1, piling the dirt above the edge of the trench. Place the trees in this trench, with the roots carefully straightened out, cover the roots and part of the stems of the trees to a depth of 2 or 3 inches with fresh moist earth dug from the steep side of the trench, and press firmly with the foot. A second layer of trees should then be put in on top of the first, and the process repeated until all the trees are in. The trees should then be covered slightly with straw or hay, to prevent evaporation from the foliage, and the hay dampened to keep the trees moist. When the time

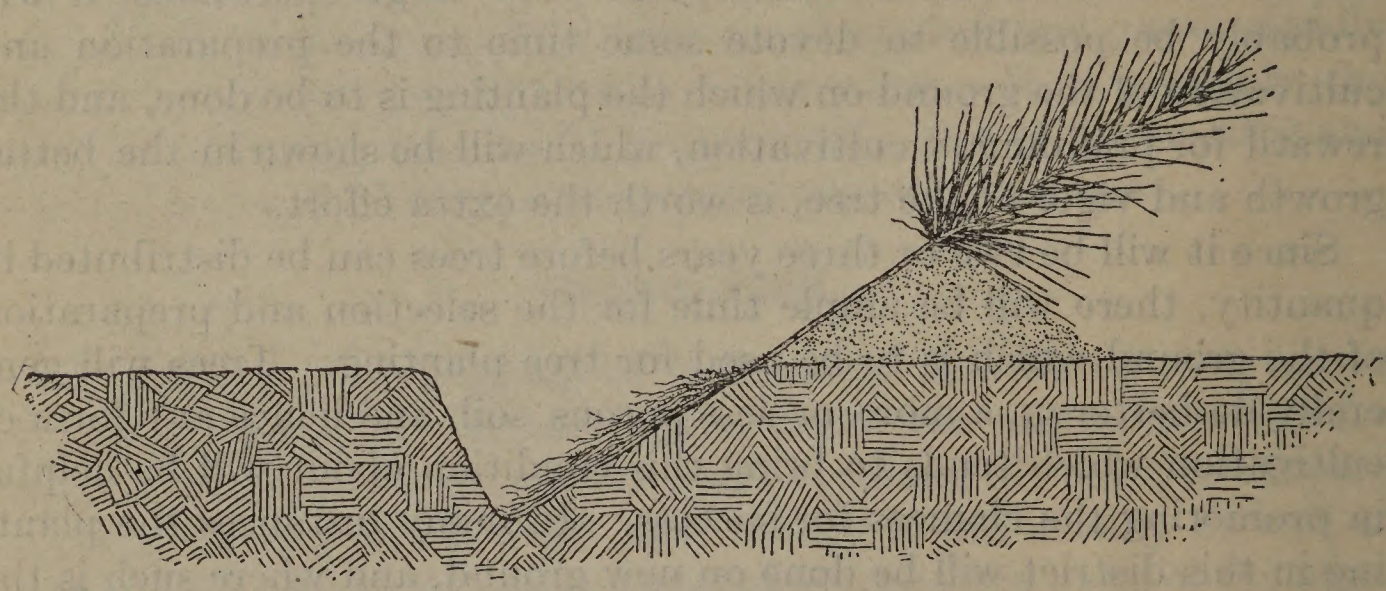

FIG. 1.—Diagram of a section of the ground, showing the method of "heeling in" trees.

comes for planting the trees, they should be dug up carefully, so as to preserve the roots intact, and placed in a box or bucket which contains some of the moss in which the trees were originally packed. The roots should be surrounded by moss, and the trees themselves covered with a piece of burlap or gunny sack saturated with water. Great care should be exercised to see that the moss which surrounds the roots is always moist.

When planting, the trees may be drawn from the bucket or box *one at a time* and put into the ground with as little exposure to the air as possible.

METHOD OF PLANTING.

Care in planting trees is as important as care in handling them, and if they do not receive careful attention when they are set in the ground they can not be expected to live. Trees which have been safely transported and carefully handled and planted will live unless the natural conditions of soil and climate are very unfavorable.

The best way to plant a tree is to dig a hole wide enough and deep enough to accommodate the entire root system without the least cramping. Holding the plant erect in one hand, so that the soil can be evenly distributed and packed around the roots, scoop in the soil a little at a time with the other hand and press it firmly around the roots, which should be spread out as much as possible. It is most important that the fine roots should be entirely surrounded with moist soil and that no air spaces exist around them. After the soil has been firmly set about the rootlets, continue to scoop in the soil, packing it closely until the hole is filled. With the heels, pack the soil closely about the stem of the tree and stamp on it until solid; finally scatter a dust mulch loosely on the surface. The soil should in no case be heaped up around the stem of the tree, but the ground should be level or even a trifle hollowed out around the stem. No dry soil should be scooped into the hole where it will come in contact with the roots. Watering at the time of planting is always advisable, especially in dry seasons and on sandy soils. Wind shields, each of which may consist of a shingle, set to protect the plant from the prevailing winds, are often necessary on exposed areas.

Spacing.—The trees should be planted in rows about 5 feet apart, and spaced from 3 to 5 feet apart in the rows; this will give room enough for development and yet will not leave the trees too far apart if there are some losses.

PROTECTION AGAINST FIRE AND CATTLE.

It is a well-known fact that many fires sweep across the prairies and hills as a result of carelessness in burning pastures or brush. To guard against this ever-present danger, a fireguard should be maintained around the plantation and great care used to see that this fireguard is always kept clear of inflammable material. A simple and effective fireguard may be made by plowing a strip a rod wide around the plantation, so as to turn under all the sod; then, leaving a space of a rod or two, plow a second strip outside the first, and when the weather is favorable burn over the strip of unplowed land between. This will make a guard 3 or 4 rods wide on which there is nothing inflammable, and except in extreme cases such a guard ought to be ample protection.

A fence should be constructed to keep out cattle, horses, and other stock. This is a most important point, since stock are likely to trample or eat the young trees.

APPLICATION AND AGREEMENT.

A form of "application and agreement" can be secured from the forest supervisor at Halsey, Nebr., and before any trees are distributed this application must be properly filled out and signed. Upon

the receipt of the signed agreement, the supervisor will distribute the trees in proportion to the number of applications and the amount of nursery stock which is available. As a guide to the proper execution of this form of agreement a sample is given.

Form 490.

APPLICATION AND AGREEMENT FOR YOUNG TREES.

NEBRASKA NATIONAL FOREST.

I, ..., a resident of that portion of Nebraska lying within the boundaries described in the act of April 28, 1904 (33 Stat., 547), entitled "An act to amend the homestead laws as to certain unappropriated and unreserved lands in Nebraska," under the provisions of the act of March 4, 1911 (36 Stat., 1235), entitled "An act making appropriations for the Department of Agriculture for the fiscal year ending June thirtieth, nineteen hundred and twelve," do apply for young trees for planting within the area above referred to.

The ground on which I desire to plant trees comprises an area of .... acres and is described as follows:

Aspect: (Faces north, south, east, or west, or is it flat?).....
Slope: (Steep or gentle?).....
Grass and sod: (Heavy or light?).....
Soil: (Loam, sandy loam, or sand?).....
Cultivation: (Has the ground been plowed?).....
(Can the ground be plowed before planting is done?).....
The purpose of this planting is (shade, windbreak, or grove?).....

In consideration of the granting of this application I promise and agree to plant all trees received by me, and to care for them in the manner described in a circular of the Forest Service, Department of Agriculture, entitled "Tree Distribution Under the Kinkaid Act, 1911," and in accordance with any later instructions received by me from the Forest Service. I further promise to mail to the forest supervisor, Halsey, Nebr., on a card, Form No. 491, prepared for this purpose, not later than November 1 of each year, for three years after the date of the latest planting done by me, a statement showing the number of trees, of each year's planting, which are surviving in the area which I have planted and the number of trees which I desire to plant during the following season. And I also agree to permit any representative of the Department of Agriculture to enter my premises at any reasonable time for the purpose of investigating the condition of the trees planted by me and the care which they have been given.

I further agree, immediately upon receipt of notice of shipment of any trees sent me, to take them without delay from the express or railroad company transporting them and to pay all of the costs of their transportation. If any package of trees is received by me in bad condition as a result of carelessness, or long period in transit, I agree to accept the same without protest and immediately to notify the forest supervisor, Halsey, Nebr.

It is further agreed that if the trees received by me at any time are not planted, or are sold, or otherwise disposed of, I am to forfeit the right to receive any more trees under the provisions of the act of March 4, 1911, herein referred to.

(Signed) .....
P. O. .....

Date .....

The form of card given herewith has been prepared for reporting the condition of the trees planted. In filling out this form, the following suggestions should be carefully noted: (1) Each spring, when the trees are received, enter the total number of trees under the column "Number of trees received," opposite the proper year; (2) at the end of the season, when the report is made (not later than November 1), fill in, under the column "Number of trees of current season's planting alive," the number living, at the time count is made, of those trees which were planted in the spring just previous; (3) then under the last two columns ("Totals") enter the total received for *all years* and the *total living for all years.* This will enable the supervisor to know at any time the success of the plantation.

Form 491. KINKAID PLANTING.

ANNUAL REPORT OF PLANTER.

FALL OF YEAR 19...

Year.	Number of trees received.	Number of trees of current year alive.	Total trees received.	Total trees alive.
1912				
1913				
1914				
1915				
Etc				

In addition to the above report, a detailed report on the method of planting and the conditions under which planting was done should be made on a record card. This card, the form of which is here given, is to be mailed to the forest supervisor, Halsey, Nebr., as soon as planting has been done.

Form 492. REPORT ON PLANTING.

19...

1. Date trees were received.....
2. Condition of trees when received.....
3. Species and number of each.....
4. Date ground was prepared for planting.....
5. Method of preparation.....
6. Weather at time of planting.....
7. Method of planting.....
8. Date of planting.....
9. Has a fireguard been established?.....
10. Has a stockguard been built?.....
11. Remarks.....

This card should be mailed to the forest supervisor as soon after planting as possible, and in any event not later than May 1.

GENERAL INSTRUCTIONS.

1. Applications for trees should be mailed to the forest supervisor, Halsey, Nebr., before February 1 of each year.

2. Form 492 should be mailed before May 1.

3. Form 491 should be mailed before November 1.

4. Mark the plantations of each year by setting stakes and marking them plainly "1912" or "1913," so that each year's planting may be identified.

5. Success in tree planting, like success in anything else, depends upon the care given to it. Protection and cultivation are necessary. Officers of the Forest Service will do all in their power to assist by advice and suggestions, but it must be borne in mind that constant care and attention on the part of the planter are necessary to success in tree planting, especially in the dry sandy soils of the Kinkaid district.

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